IN THE CLAIMS

Listing of Claims

1. (Currently Amended) A laser ~~waveguide~~ discharge chamber for use in ~~waveguide~~ lasers comprising:

an upper electrode, the upper electrode having a first surface; and

a lower electrode, the lower electrode having a second surface, where the first surface and second surface are separated by at least ~~one~~ two sidewalls, where the first surface and the second surface face each other, ~~portions of which are not completely covered by the at least one sidewall~~, ~~and~~ where the first surface, second surface, and the at least ~~one~~ two sidewalls form the laser discharge region~~waveguide~~, where the at least two sidewalls are sectional sidewalls.

2. (Cancelled)

3. (Cancelled)

4. (Currently Amended) The laser ~~waveguide~~ discharge chamber according to claim [[3]] 1, wherein the sectional sidewalls are separated by sectional gaps.

5. (Currently Amended) The laser ~~waveguide~~ discharge chamber according to claim [[1]] 4, wherein the at least ~~one~~ two sidewalls ~~is~~ are made of ceramic.

6. (Currently Amended) The laser ~~waveguide~~ discharge chamber according to claim [[1]] 5, wherein the at least ~~one~~ two sidewalls ~~is~~ are made of BeO.

7. (Currently Amended) The laser ~~waveguide~~ discharge chamber according to claim [[1]] 5, wherein the at least ~~one~~ two sidewalls ~~is~~ are made of AlN.

8. (Currently Amended) The laser ~~waveguide~~ discharge chamber according to claim [[1]] 5, wherein the electrodes are made of metal.

9. (Currently Amended) The laser ~~waveguide~~ discharge chamber according to claim [[3]] 4, wherein the sectional sidewalls are under 200.0 mm in length.

10. (Currently Amended) The laser ~~waveguide~~ discharge chamber according to claim [[1]] 8, wherein a protrusion is formed in at least one of the upper electrode ~~is shaped to form first protrusion(s) that decrease the distance between the first protrusion(s)~~ and the lower electrode.

11. (Cancelled)

12. (Cancelled)

13. (Currently Amended) A ~~waveguide~~ laser comprising:

a laser ~~waveguide~~ discharge region, wherein at least a portion of the laser discharge region ~~waveguide~~ is ~~formed~~ surrounded by electrodes and at least ~~one~~ two sidewalls ~~such that no surface of the electrodes forming the boundary of the waveguide is completely covered by the at least one sidewall~~, wherein the at least two sidewalls are sectional sidewalls;

an oscillating electromagnetic field, wherein the electromagnetic field is produced by an oscillating current supplied to the electrodes such that the electromagnetic field is produced in the laser discharge region ~~waveguide~~; and

a lasing material placed in the discharge region ~~waveguide~~, wherein the electromagnetic field produces stimulated emission of electromagnetic radiation from the lasing material.

14. (Currently Amended) The ~~waveguide~~ laser according to claim 13, further comprising:

a RF power supply, wherein the RF power supply powers the oscillating electromagnetic field; and

a microprocessor[[;]], wherein the microprocessor operates at a frequency higher than the frequency of the oscillating electromagnetic field and controls operations of the RF power supply.

15. (Cancelled)

16. (Cancelled)

17. (Currently Amended) The ~~waveguide~~ laser according to claim [[16]] 13, wherein the sectional sidewalls are separated by sectional gaps.

18. (Currently Amended) The ~~waveguide~~ laser according to claim [[13]] 17, wherein the at least ~~one~~ two sidewalls ~~is~~ are made of ceramic.

19. (Currently Amended) The ~~waveguide~~ laser according to claim [[13]] 18, wherein the at least ~~one~~ two sidewalls ~~is~~ are made of BeO.

20. (Currently Amended) The ~~waveguide~~ laser according to claim [[13]] 18, wherein the at least ~~one~~ two sidewalls ~~is~~ are made of AlN.

21. (Currently Amended) The ~~waveguide~~ laser according to claim [[13]] 18, wherein the electrodes are made of metal.

22. (Currently Amended) The ~~waveguide~~ laser according to claim 17, wherein the sectional sidewalls are under 200.0 mm in length.

23. (Currently Amended) The ~~waveguide~~ laser according to claim [[13]] 21, wherein a protrusion is formed in at least one of the the upper electrode ~~is shaped to form first protrusion(s) that decrease the distance between the first protrusion(s)~~ and the lower electrode.

24. (Cancelled)

25. (Cancelled)

26. (Currently Amended) The ~~waveguide~~ laser according to claim 13, wherein the lasing material is CO_2.

27. (Currently Amended) The ~~waveguide~~ laser according to claim 13, wherein the lasing material is a mixture of CO_2.

28. (Currently Amended) The [[A]] ~~waveguide~~ laser according to claim 13 further comprising:

~~a laser waveguide, wherein the laser waveguide is formed by electrodes and at least one sidewall such that no surface of the electrodes forming the boundary of the waveguide is completely covered by the at least one sidewall, where the sidewall has first and second surfaces forming a portion of the laser waveguide, and where the portion varies in distance from the first surface to the second surface along the length of the waveguide;~~

a housing, where the housing encompasses the laser discharge region~~waveguide~~ and is pressurized to sub-atmospheric pressures.~~;~~

~~an oscillating electromagnetic field, wherein the electromagnetic field is produced by an oscillating current supplied to the electrodes such that the electromagnetic field is produced in the laser waveguide; and~~

~~a lasing material placed in the waveguide, wherein the electromagnetic field produces stimulated emission of electromagnetic radiation from the lasing material.~~

29. (Cancelled)

30. (Currently Amended) The ~~waveguide~~ laser of claim 28, wherein the housing is formed from the at least ~~one~~ two sidewalls.

31. (Currently Amended) The ~~waveguide~~ laser of claim 28, wherein the housing is formed from at least one of the electrodes.

32. (Currently Amended) The ~~waveguide~~ laser of claim 28, wherein the cross-section of the discharge region ~~distance between centerlines of the cross-sections of the electrodes~~ varies along the length of the ~~waveguide~~ discharge region.

33. (Currently Amended) The ~~waveguide~~ laser of claim 28, wherein the distance between the first and second surfaces varies along the length of the ~~waveguide~~ laser.

34. (Withdrawn) A method of forming a laser waveguide comprising:

placing an upper electrode, the upper electrode having a first surface with a protrusion;

positioning at least one sidewall on the first surface, such that the at least one sidewall does not completely cover the first surface; and

positioning a lower electrode on the at least one sidewall, the lower electrode having a second surface, where the at least one sidewall does not completely cover the second surface, and where the placement of the upper electrode, positioning of the lower electrode and the at least one sidewall, forms a laser waveguide having a compact structure.

35. (Withdrawn) The method of claim 34, further comprising:

forming the at least one sidewall, where the forming step is comprised of:

pressing at least one ceramic piece into a desired shape; and

grinding the at least one ceramic piece to a first tolerance.

36. (Withdrawn) The method of claim 34, further comprising:

forming the lower electrode, where the forming step is comprised of:

milling the lower electrode to a second tolerance.

37. (Withdrawn) The method of claim 34, further comprising:

forming the upper electrode, where the forming step is comprised of:

milling the upper electrode to a third tolerance.

38.(New) The laser according to claim 13, wherein the laser is a waveguide laser such that the sidewalls and electrodes guide the electromagnetic field formed in the discharge chamber .

39. (New) A laser discharge chamber for use in lasers comprising:

an upper electrode, the upper electrode includes a first surface;

a lower electrode, the lower electrode includes a second surface, where the first surface and second surface are separated by region, where the a portion of the region defines a discharge region; and

at least one protrusion, where the protrusion is formed on at least one of the upper electrode and the lower electrode, and wherein the at least one protrusion is configured to aid in discharge in the discharge region.

40. (New) The laser discharge chamber of claim 39, further comprising:

at least two sectional sidewalls opposite each other, wherein the sidewalls and the upper and lower electrodes surround the discharge region.

41. (New) The laser discharge chamber of claim 40, wherein the sectional sidewalls are made of ceramic.

42. (New) The laser discharge chamber of claim 41, wherein the sidewalls are made of BeO.

43. (New) The laser discharge chamber of claim 42, wherein an electromagnetic field in the discharge region is guided by the discharge chamber.

44. (New) The laser discharge chamber of claim 1, wherein the at least two sidewalls are connected.

45. (New) The laser of claim 13, wherein the at least two sidewalls are connected.